

Chromatic Dispersion Penalty of 4x100G DMT for 10km SMF PMD

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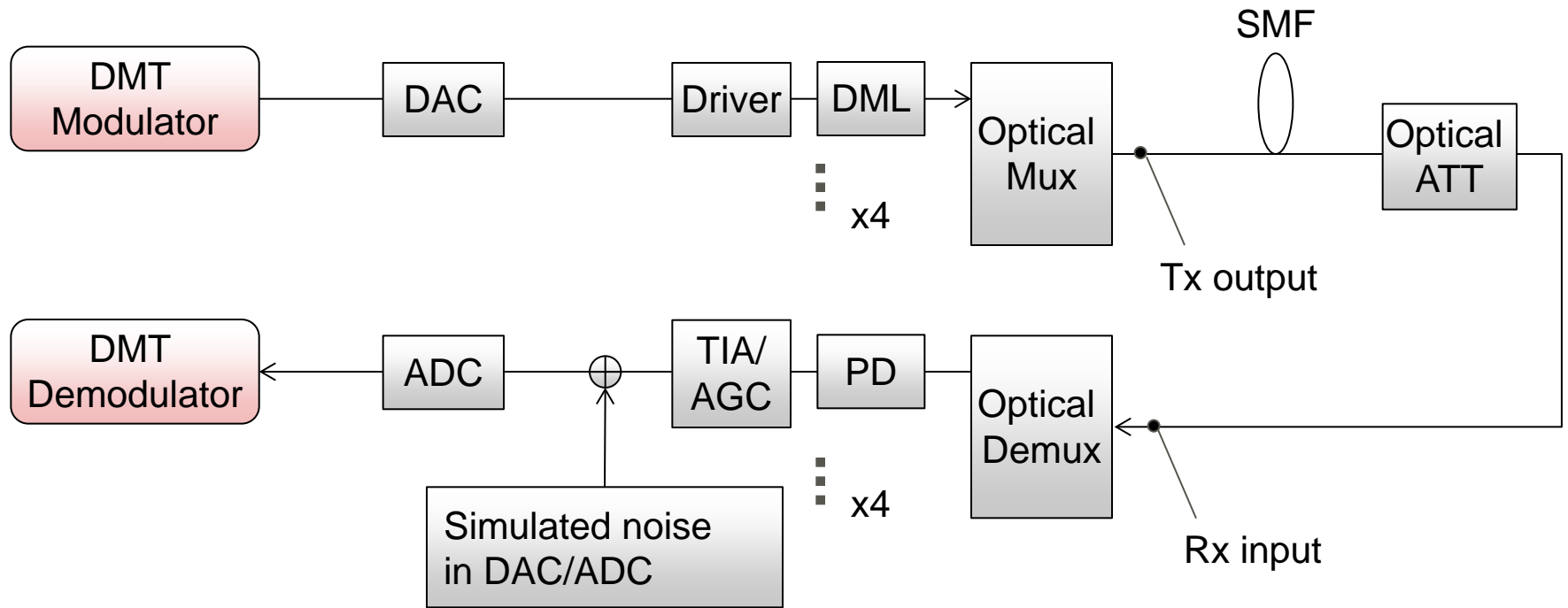
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Introduction

- We have reported simulation and experimental results on the chromatic dispersion penalty of 4x100G DMT over 10km SMF with BCH-FEC.
 - Details can be found in tanaka_01_0215_smf, tanaka_3bs_01_1114, and tanaka_3bs_01_0514.
 - Dispersion penalty was about 1 dB for the worst channel in channel specification for chromatic dispersion from IEEE802.3ba.
- In this contribution we present simulation results on the chromatic dispersion penalty of 4x100G DMT over 10-km SMF with KP4 FEC.

Simulation Platform



DMT Parameter	Value
Number of subcarriers	256
Cyclic prefix	16
DMT probing signal	2 bit
Bit-loading algorithm	Chow ^{*1}

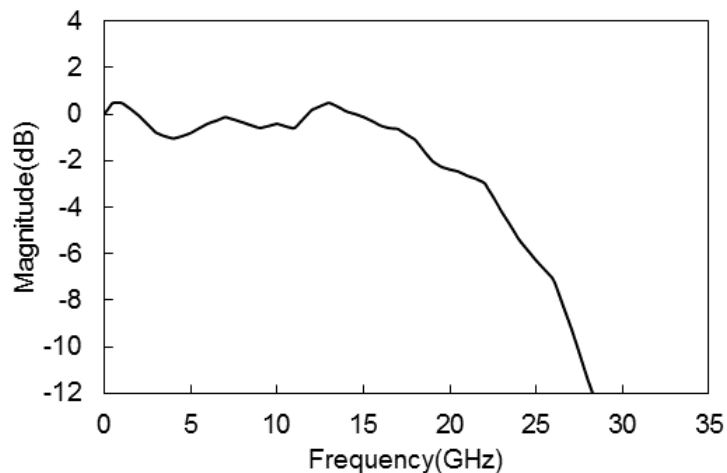
Bitrate = 4 x 106.25Gbps (100GbE + KP4 FEC OH)

*1: ref.: P.S.Chow, et. al., "A practical discrete multitone transceiver loading algorithm for data transmission over spectrally shaped channels," IEEE Trans. Commun., vol.43, no.2, pp.773-775, (1995).

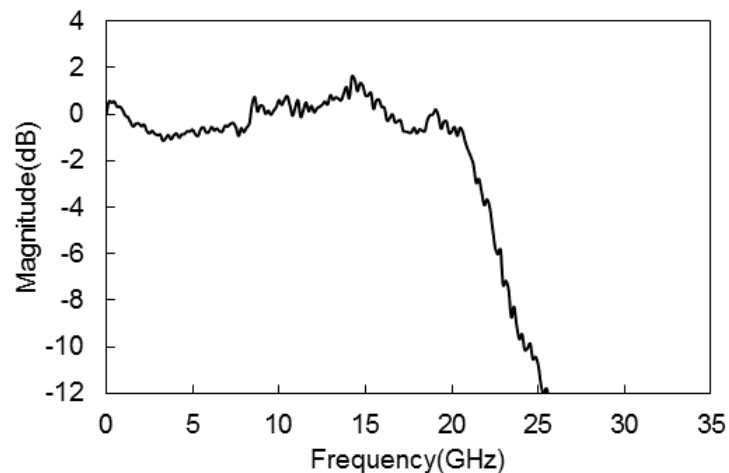
Parameters

■ Frequency response model

➤ Tx Cascade



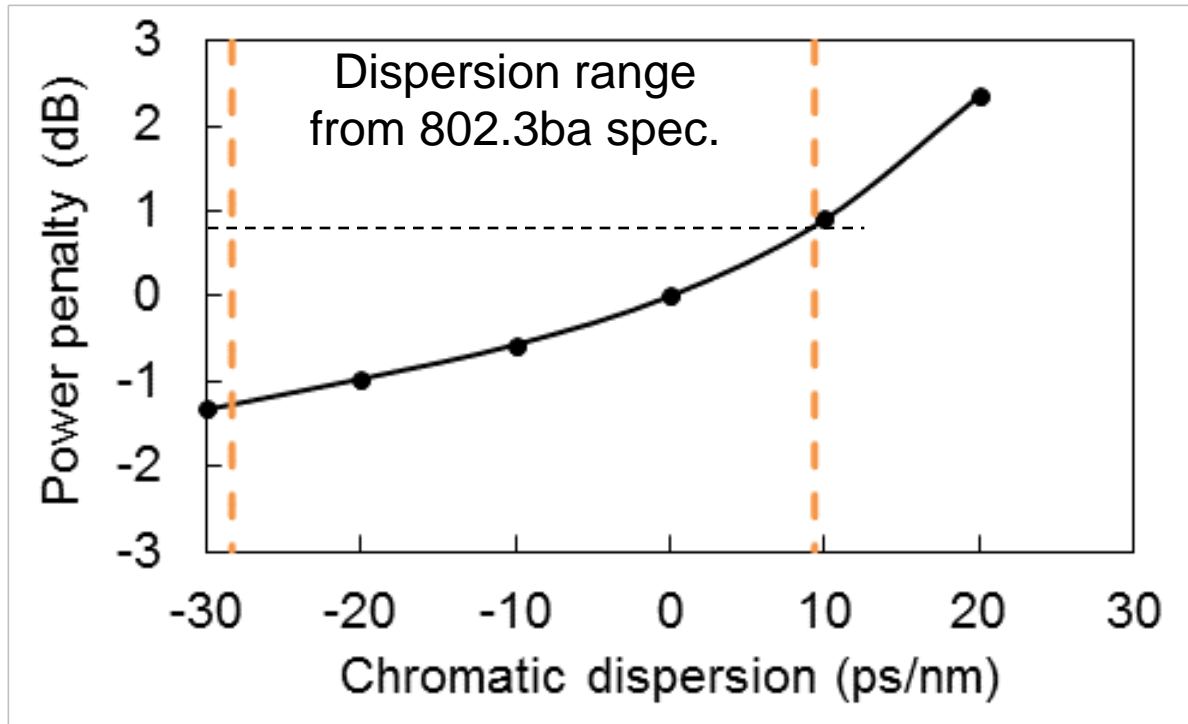
➤ Rx Cascade



Parameter	Value
Sampling rate	64 GS/s
Optical modulation index	0.45
DML RIN	-148 dB/Hz
DML chirp	3.5
PD/TIA-noise	12 pA/ $\sqrt{\text{Hz}}$

- To close the link budget for 10-km reach with KP4 FEC we enhance the bandwidths of Tx and Rx cascades as shown.

Chromatic Dispersion Penalty



- Chromatic dispersion penalty remains below 1 dB
 - Channel specification for dispersion from IEEE802.3ba
 - 4ch. LAN-WDM configuration
 - After 10-km SMF

Summary

- We have performed simulations of receiver sensitivity and power penalty due to chromatic dispersion for 400GbE DMT over 10km SMF with KP4 FEC.
- The dispersion power penalty over the dispersion window from 802.3ba was shown to remain below 1.0 dB.

Thank you